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AUTHOR Mayer, Victor J.; Fortner, Rosanne W.
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ABSTRACT

Four different methods for disseminating materials and activities used in a program to teach middle school students about aquatic environments were compared in Ohio. Six hundred teachers elected to attend one-and-a-half day workshops, 180 teachers attended workshops requiring 10 full days' participation, 200 teachers ordered materials by mail, and 400 teachers took advantage of a museum's sponsorship of selected program activities for groups of students. Questionnaires were sent to a sample of the teachers in each group. The responses indicated that those attending the short workshops used the materials and activities at a higher rate, and introduced them to others at a higher rate, than did teachers in other groups. Participants in the museum program showed the least use. Differences among the teachers making up the groups appeared to have greater impact on use than did the presentation format. Analysis showed that teachers selecting short workshops were less likely to have master's degrees and more likely to attend professional meetings and to participate on curriculum and textbook adoption committees. They appeared more interested in the professional benefits of the workshop than in the larger number of academic credits associated with the larger workshop. (PGD)

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RELATIVE EFFECTIVENESS OF FOUR MODES OF DISSEMINATION OF CURRICULUM MATERIALS

by

Victor J. Mayer and Rosanne W. Fortner

The Ohio State University

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BACKGROUND

A project funded by the Ohio Sea Grant Program in 1977 resulted in the development of instructional activities related to the marine and aquatic environments (Oceanic Activities for Great Lakes Schools - OEAGLS). A subsequent three-year long project was started in 1980 to disseminate these materials to middle school teachers in Ohio. Four different means of dissemination were used. A research study was conducted during the first half of 1984 to determine the relative effectiveness of the modes of dissemination in terms of the degree of usage of the materials.

The four means of dissemination were as follows:

1. Awareness workshops. These were short 1 1/2 day workshops conducted for large groups of teachers in 14 different locations around the state of Ohio. Two university professors organized and conducted the workshops which consisted of several short lectures and a series of concurrent sessions using the OEAGLS materials. Many of the concurrent sessions were conducted by local teachers. Participants had the option of obtaining one quarter hour of graduate credit at no cost, however a small materials fee was charged. About 600 teachers enrolled in these programs.

2. Implementation workshops. These were longer programs conducted every day for two weeks during the summer, or on a one-day a week basis for ten weeks during the regular academic year. Instruction was by the same two university professors and used the OEAGLS activities as a basis for communicating information about marine and aquatic topics and appropriate methods for teaching those topics. Participants received 3 to 4 quarter hours of graduate credit at no cost other than a small materials fee. About 180 teachers were enrolled in the 6 programs in this category.

3. Mail orders. Over a two year period of time, some 200 individuals ordered OEAGLS activities as a result of their being advertised in a project newsletter or in other sources. There was a nominal charge for the activities.

4. Museum student program. A program on Lake Erie was offered by the Center of Science and Industry (COSI) in Columbus during the 1982-83 school year. About 400 teachers who brought their students to the program were given an OEAGLS activity of their choice.

There are 23 OEAGLS activities, each consisting of a student guide and a teacher guide. Topics are interdisciplinary focusing on the natural environment, history, geography, and economics of the Great Lakes and especially Lake Erie. They were developed by teams consisting of a classroom teacher, a curriculum writer (university professor) and a content specialist. Each went through a procedure of pilot testing and formative evaluation (Mayer and Fortner, 1983). They are designed to focus on concepts that are a common part of the middle school curriculum, placing them in an Ohio and Great Lakes context. Several characteristics in addition to a detailed teacher guide were intended to facilitate the use of the materials by teachers. Each activity is designed to take about two to three periods of class time. They are in a format that can be reproduced by the teacher. Although they are designed to involve students actively, they do not require expensive or hard-to-get materials.

METHOD

A questionnaire consisting of 20 items in an objective response format was developed to determine the relative usage of the instructional materials, to evaluate the relative effectiveness of different modes of dissemination, and to obtain information on teacher background characteristics. The instrument was refined through its use by students enrolled in a first year doctoral seminar.

A 30% random sample was drawn from the awareness workshop, implementation workshop and mail order populations and a 20% random sample from the museum student program population. The questionnaire was mailed to the individuals drawn in the samples. A combination of follow-up techniques resulted in the following response rates: awareness 78%, implementation 76%, mail orders 61%, and museum 48%. A telephone survey of a 20% random sample of the non-respondents was conducted to determine the equivalence of the respondents and non-respondents on certain variables. The actual number contacted in each group was too small to do statistical comparisons, however it appeared that there were no differences between non-respondents and respondents on use of OEAGLS activities and on other items chosen from the questionnaire.

RESULTS AND DISCUSSION

A preliminary analysis was performed through the generation and examination of two-way tables using the groups as one of the variables. An intersection between awareness and implementation workshop groups occurred with a sizeable number of teachers having participated in both activities. Their data were separated out to form a fifth group.

Three usage variables were examined. In the first teachers were asked whether they were using the instructional materials during the current school year. Those who were were then asked if they had introduced them to other teachers in their school, and to teachers in other schools. Responses are included in Table 1.

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INSERT TABLE 1 ABOUT HERE

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A one-way analysis of variance was performed on the use variable between the five groups. The between group differences were significant at the 0.0001 level. Therefore the various modes of dissemination were distinctly different in their effectiveness in terms of the subsequent use of the materials by the recipients. To determine which methods were most effective additional ANOVAs were run; between the awareness group, the implementation group, and the combined awareness-implementation group, and between the awareness and the implementation groups. The results of the first were significant at the 0.08 level and the second at the 0.03 level. It therefore appears that the differences between the awareness and implementation groups on use of the OEAGLS activities are significant.

It is surprising to note that those teachers enrolled in the short awareness workshops had a significantly higher rate of usage, and also the highest rate of introduction of materials to other teachers in their schools. This is the reverse of what might be expected. In justifying the offering of the longer workshops it was believed that the longer time would permit greater depth of instruction resulting in more confidence with using the materials and thus higher usage. The relatively high usage by the mail order group was not expected since there was no direct contact nor teacher training. On the other hand it is not totally surprising, since these people had enough knowledge and interest in the activities to go to the trouble of ordering and paying for them. It is reasonable to assume that they would have the incentive to actually use

them in the classroom.

Of further interest is the lack of usage among those teachers who were simply given an activity in the museum program without any formal workshop experience. The program was expected to raise interest in the subject matter to the point where teaching about it was stimulated. From these results it might be suspected that other short exposures on subject matter and materials, such as those offered at state or national conventions, may have similar low levels of impact on teachers.

Why the difference between the awareness and implementation groups? All workshops were conducted by the same people and followed similar philosophies using similar materials. Formative evaluations of the workshops indicate that the short and long ones were at least equally effective in training teachers. This leads to the conclusion that there must be differences in the teachers who elected to attend the two types of workshops.

Responses to items on the questionnaire permitted an examination of certain teacher background characteristics. A discriminant analysis program was run to determine which teacher background characteristics discriminated among the three workshop groups. Six characteristics (Table 2) were weighted on two functions with a Wilkes Lambda of 0.88 (12 df) significant at the 0.075 level for function 1 and a Wilkes Lambda of 0.094 (5 df) significant at the 0.095 level for function 2.

Background characteristics which were important in discriminating among groups were semester hours in education courses, number of years teaching, completion of master's degree, number of education association meetings attended, and service on curriculum or textbook adoption committees.

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INSERT TABLE 2 ABOUT HERE

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The teachers selecting the short awareness workshops (Table 3) were less likely to have a master's degree, more likely to attend professional education meetings and more likely to participate in curriculum and textbook adoption committees. It appears therefore that they are the type who are more interested in the professional benefits derived from such participation than in the academic credit given since it is greater in the longer programs. Those teachers taking the implementation workshops may be more concerned about gaining hours toward the Master's degree or toward the next level of their district's salary scale. This is supported by the fact that teachers taking both workshops (hence accumulating the maximum amount of credit available) had the most education courses, were most likely to have a Master's degree and had been in teaching the shortest time.

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INSERT TABLE 3 ABOUT HERE

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CONCLUSION

The results of this study provide some intriguing insights into the relative effectiveness of common dissemination modes. Simply giving an activity to a teacher is worthless. It won't be used. Those individuals who order activities by mail will probably use them. What is surprising is that longer workshops do not lead to greater usage. This seems to be related to the type of

individual attracted into each of the two types of workshops. Although similar in the usual teacher background characteristics, there seems to be a difference in several characteristics that together may imply a professional orientation that motivates the choices of workshops made by teachers.

For materials disseminators it is apparent that money is better spent on short workshops. They tend to attract those teachers who are more likely to use the materials presented. And obviously more workshops reaching more teachers can be offered for the money available.

TABLE 1: Use of Instructional Materials
By Type of Dissemination Effort.

Group	Use by Teacher		Introduced To Other Teacher		Introduced To Other School	
	N[1]	Percent	N	Percent	N	Percent
Awareness	102	78	82	73	74	16
Implementation	32	58	19	63	15	33
Awareness and Implementation	21	81	18	72	18	17
Mail Order	26	54	12	58	14	50
Museum	25	4	1	0	0	0

1.N = Number of respondents on item

TABLE 2

Standardized Canonical Discriminant
Function Coefficients

VARIABLE	FUNCTION 1	FUNCTION 2
Education Courses	0.893	0.264
Masters Degree	-0.036	0.471
Years Teaching	-0.620	-0.373
Education Magazines	0.369	-0.381
Education Meetings	-0.049	-0.414
Committee Memberships	-0.248	0.693

TABLE 3

Means Of Variables Used In Discriminant Analysis

VARIABLE	GROUP AW	IM	AW-IM
Science Courses	3.79	3.69	3.76
Education Courses	4.79	4.53	5.33
Masters Degree	0.54	0.59	0.62
Years Teaching	14.99	14.50	12.67
Education Magazines	2.08	1.56	1.90
Education Meetings	1.26	0.81	0.71
Committee Memberships	1.15	1.34	1.24